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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/728,852	12/01/2000	M.Cameron Watson	NCRC-0021-US(9261)	4243

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EXAMINER

MAHMOUDI, HASSAN

ART UNIT

PAPER NUMBER

2175

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Please find below and/or attached an Office communication concerning this application or proceeding.

176

<i>W</i> <b>Office Action Summary</b>	Application No.	Applicant(s)
	09/728,852	WATSON ET AL.
	Examiner Tony Mahmoudi	Art Unit 2175

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) This action is FINAL.                            2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-21 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on \_\_\_\_\_ is: a) approved b) disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) All b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121. *DOV POPOVICI*

**Attachment(s)**

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____	6) <input type="checkbox"/> Other: _____

*DOV POPOVICI*  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2100**

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3 and 6-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reiner et al (U.S. Patent No. 6,289,334) in view of Nori et al (U.S. Patent No. 6,061,690.)

As to claim 1, Reiner et al teaches method (see Abstract), comprising:  
receiving data relating to a database system (see column 2, lines 53-60, where “receiving data” is read on “accessing data records stored in a database table”);  
partitioning the data for storage in a database system having plural data storage units based on the characteristic associated with the data (see column 3, lines 32-46, and see column 11, lines 27-31); and  
storing the partitioned data in one or more storage units of the database system (see column 2, line 61 through column 3, line 3, and see column 3, lines 46-52.)

Reiner et al does not teach:  
receiving, from the device, information associated with at least one characteristic of the data.

Nori et al teaches a method for storage of object collections in a database system (see Abstract), in which he teaches receiving, from the device, information associated with at least one characteristic of the data (see column 11, lines 25-37, where “information associated with characteristics of the data” is read on “a set of parameters”.)

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Reiner et al to include receiving, from the device, information associated with at least one characteristic of the data.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Reiner et al by the teaching of Nori et al, because receiving, from the device, information associated with at least one characteristic of the data, would enable the user to receive relational information about the data and define the relationships between data segments partitioned and stored in the plurality of storage devices.

As to claim 2, Reiner et al as modified teaches wherein receiving the information comprises receiving the information from a client system, the device comprising the client system (see Reiner et al, figures 11-13, and see column 5, lines 25-27, and see column 30, lines 12-36.)

As to claim 3, Reiner et al as modified teaches wherein receiving the information comprises receiving at least one of an average value of the data (see Reiner et al, column 9, lines 57-61) a uniform distribution of the data (see Reiner et al, column 4, lines 37-42, where “uniform distribution” is read on “distributed roughly evenly”), a minimum value of the data

(see Reiner et al, column 9, lines 50-56), and a maximum value of the data (see Reiner et al, column 16, lines 43-48.)

As to claim 6, Reiner et al as modified teaches wherein partitioning the data for storage in the database system comprises dividing the data into segments containing related data (see Reiner et al, column 26, lines 19-22, where “dividing the data into segments” is read on “one or more files to which the query’s reads will be restricted”.)

As to claim 7, Reiner et al as modified teaches wherein partitioning the data comprises organizing the data into related portions (see Reiner et al, column 10, lines 62-67, and see column 27, lines 53-64.)

As to claim 8, Reiner et al as modified teaches wherein partitioning the data further comprises executing an algorithm to organize the data (see Reiner et al, column 10, line 62 through column 11, lines 26, where “executing an algorithm” is read on “combining DBMS’s indexing and hashing mechanisms”.)

As to claim 9, Reiner et al as modified teaches wherein storing the partitioned data in the database system comprises storing the partitioned data in a relational database system (see Reiner et al, column 7, lines 43-48.)

As to claim 10, Reiner et al as modified teaches the method further comprising storing the partitioned data under the supervision of a limited number of data servers relating to the database system (see Reiner et al, column 10, lines 37-52.)

As to claim 11, Reiner et al teaches an apparatus (see Abstract), comprising:  
a database (see figure 3A);  
a network interface (see figure 2, and see column 2, line 61 through column 3, line 3);  
a database controller coupled to the database (see column 5, lines 37-42), wherein the database controller is adapted to perform a partitioning task on data received through the network interface based on the partitioning information (see column 24, lines 8-36),  
the database controller adapted to further store the data that is partitioned by the partitioning task (see column 145, lines 2-5), the partitioning task to identify one or more portions of the database in which each segment of the partitioned data is stored (see column 3, lines 38-42.)

Reiner et al does not teach receiving partitioning information.

Nori et al teaches a method for storage of object collections in a database system (see Abstract), in which he teaches receiving partitioning information (see column 11, lines 25-37, where “information” is read on “a set of parameters”, and see column 17, lines 33-48.)

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Reiner et al to include receiving partitioning information.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Reiner et al by the teaching of Nori et al, because receiving partitioning information, would enable the system to define the size, level, and structure of the data partitions within a relational database, based on the information received on the actual data contents to be stored in the appropriate partition.

As to claim 12, Reiner et al as modified teaches wherein the database is a parallel database system (see Reiner et al, column 145, lines 2-5.)

As to claim 13, Reiner et al as modified teaches wherein the database is a relational database (see Reiner et al, column 7, lines 43-48.)

As to claim 14, Reiner et al as modified teaches wherein the database controller comprises:

a query coordinator coupled to the network interface, the query coordinator to receive query requests from the network interface (see Reiner et al, column 145, lines 2-27);

a partitioner to partition data and perform at least one of storing and locating partitioned data in the database in response to the query requests (see Reiner et al, column 24, lines 8-36); and

a partitioner data storage coupled to the partitioner, the partitioner data storage to store information (see Reiner et al, column 2, line 61 through column 3, line 3, and see column 3, lines 46-52) associated with at least one characteristic of the data (see Nori et al, column 11,

lines 25-37, where “information associated with characteristics of the data” is read on “a set of parameters”) to enable the partitioner to partition data (see Reiner et al, column 24, lines 8-36.)

As to claim 15, Reiner et al as modified teaches wherein the partitioner is capable of executing an algorithm, based on the stored information, for partitioning the data (see Reiner et al, column 10, line 62 through column 11, lines 26, where “executing an algorithm” is read on “combining DBMS’s indexing and hashing mechanisms”.)

As to claim 16, Reiner et al as modified teaches the system further comprising a plurality of data servers to store and access partitioned data in the database (see Reiner et al, column 5, lines 56-65.)

As to claim 17, Reiner et al as modified teaches the system further comprising a client system, wherein the client system sends data to the database through the network interface (see Reiner et al, column 31, lines 47-52.)

As to claim 18, Reiner et al as modified teaches wherein the client system sends at least one characteristic of the data to be used by the database controller to partition the data (see Nori et al, column 11, lines 25-37, where “characteristic of the data” is read on “a set of parameters”, and see column 17, lines 33-48.)

As to claim 19, Reiner et al teaches an article comprising one or more storage media (see column 3, lines 45-49) containing instructions (see column 6, lines 32-35) that when executed cause a device to:

receive information to be stored into a database from a remote device (see column 2, lines 53-60, where “receiving information” is read on “accessing data records stored in a database table”);

partition the data for storage in a database system based on the characteristic of the data (see column 3, lines 32-46, and see column 11, lines 27-31); and

store the partitioned data in the database system (see column 2, line 61 through column 3, line 3, and see column 3, lines 46-52.)

Reiner et al does not teach:

receiving information associated with at least one characteristic of the data.

Nori et al teaches a method for storage of object collections in a database system (see Abstract), in which he teaches receiving information associated with at least one characteristic of the data (see column 11, lines 25-37, where “information associated with characteristics of the data” is read on “a set of parameters”.)

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Reiner et al to include receiving information associated with at least one characteristic of the data.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Reiner et al by the teaching of Nori et al, because receiving information associated with at least one characteristic of the data, would enable the

user to receive relational information about the data and define the relationships between data segments partitioned and stored in the plurality of storage devices.

As to claim 20, Reiner et al as modified teaches wherein the instructions when executed cause the device to execute an algorithm to partition the data (see Reiner et al, column 10, line 62 through column 11, lines 26, where “executing an algorithm” is read on “combining DBMS’s indexing and hashing mechanisms”.)

As to claim 21, Reiner et al as modified teaches wherein the instructions when executed cause the device to divide the data into segments containing related data (see Reiner et al, column 26, lines 19-22, where “dividing the data into segments” is read on “one or more files to which the query’s reads will be restricted”.)

3. Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reiner et al (U.S. Patent No. 6,289,334) in view of Nori et al (U.S. Patent No. 6,061,690) as applied to claims 1-3 and 6-21 above, and further in view of Natarajan (U.S. Patent No. 5,400,371.)

As to claim 4, Reiner et al as modified teaches partitioning the data (see Reiner et al, column 3, lines 32-46, and see column 11, lines 27-31.)

Reiner et al, as modified does not teach defining straight-line segments based on at least one of the average value of the data, the uniform distribution of the data, the minimum value of the data, and the maximum value of the data.

Natarajan teaches a system and method for filtering random noise using data compression (see Abstract), in which he teaches defining straight-line segments (see figure 1, and see column 6, lines 35-46) based on at least one of the average value of the data (see column 12, lines 8-14), the uniform distribution of the data, the minimum value of the data, and the maximum value of the data (see column 5, lines 36-46, and see lines 63-68.)

Therefore, it would have been obvious to a person having ordinary skill in the art to have modified Reiner et al as modified to include defining straight-line segments based on at least one of the average value of the data, the uniform distribution of the data, the minimum value of the data, and the maximum value of the data.

It would have been possible to a person having ordinary skill in the art at the time the invention was made to have modified Reiner et al as modified, by the teaching of Natarajan, because defining straight-line segments based on at least one of the average value of the data, the uniform distribution of the data, the minimum value of the data, and the maximum value of the data, would enable the system to linearly approximate the value of the non-linear data based on where the majority of the calculated data points are positioned.

As to claim 5, Reiner et al as modified teaches wherein partitioning the data (see Reiner et al, column 3, lines 32-46, and see column 11, lines 27-31) further comprises defining breakpoints to provide the straight-line segments (see Natarajan, column 3, lines 33-51, and see column 11, lines 10-16.)

*Conclusion*

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to further show the state of art with respect to methods and systems of database queries, database linearization, and database partitioning in general:

U.S. Patent No. 3,699,318 to Underkoffler et al.

U.S. Patent No. 6,014,656 to Hallmark et al.

U.S. Patent No. 6,415,286 to Passera et al.

5. Any inquiries concerning this communication or earlier communications from the examiner should be directed to Tony Mahmoudi whose telephone number is (703) 305-4887. The examiner can normally be reached on Mondays-Fridays from 08:00 am to 04:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dov Popovici, can be reached at (703) 305-3830.

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October 7, 2002



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